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ABSTRACT

This paper discusses the programmatic concerns, the evaluation, and the ultimate decisions which led to the transfer of CIS (Chemical Information System) to the private sector. CIS is a complex, integrated system of some 20 chemical databases and data analysis programs which provide access to physical, toxicological, environmental effects, and regulatory data on approximately 350,000 chemicals. Originating at the National Institutes of Health in the early 1970's, CIS was transferred to the U.S. Environmental Protection Agency (EPA) in 1973. Subsequently, EPA was responsible for the coordination of the system's activities, the letting of contracts, and the provision of several databases to the system. Both the problems in funding and management associated with EPA control, and the actions taken by EPA which eventually led to the transfer of the system to the private sector, are discussed. These actions included: (1) addressing problems associated with management issues under the present contract; (2) a major information management review of all aspects of the system and an internal management review; (3) establishment of two review panels to provide objective evaluations of the system and its framework; and (4) a report from the review panels. The panels found that existing CIS capabilities were inadequate to meet demands for chemical information, and recommended a more appropriate management concept--a separate government management role from a private sector implementation role. The report concludes with information on how the transfer of CIS to the private sector was accomplished, and a discussion of the changing conditions that made such a transfer necessary. (JB)

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TRANSFER OF THE EPA/NIH CHEMICAL INFORMATION SYSTEM (CIS) TO PRIVATE MANAGEMENT, by Sarah T. Kadec and Antonio Jover*

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Before discussing the programmatic concerns, the evaluation and ultimate decisions which led to the transfer of CIS to the private sector, some background on CIS for those of you who are not familiar with the system will be needed.

CIS is a complex, integrated system of some 20 chemical data bases and data analysis programs providing access to physical, toxicological, environmental effects, and regulatory data on approximately 350,000 chemicals. The Structure and Nomenclature Search System, commonly known as SANNS, is the heart of the system. SANNS provides the user the ability to identify chemical compounds from their mass spectra, and to perform structure, substructure and full or partial name searching. Further it allows the user to locate where information about the chemical compound exists in CIS.

The system originated at the National Institutes of Health in the early 1970's and was transferred to the U. S. Environmental Protection Agency (EPA) in 1973. More data bases were added and, through its contractor, the system was made publicly available. EPA was responsible for the coordination of the systems' activities, the letting of contracts, and the provision of several data bases to the sytem. Other data bases were sponsored by

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the Food and Drug Administration, National Bureau of Standards, the Consumer Product Safety Commission and the National Institute for Occupational Safety and Health. A steering committee, and later a Management Board, made up of representatives of the sponsoring Agencies, shared responsibility for decisions regarding the system. Sponsoring agencies supported development work and maintenance of the system and provided data up-dates. As Federal budgets became tighter, funding of the CIS by the sponsoring agencies depended more on what could be provided rather than what was needed, and then often from year end funds. Fees collected for use of the sytem were difficult to apply back to the contract for development and maintenance activities. In 1982-83, a program was developed with the National Technical Information Service (NTIS) to bill for use of the system. Monies collected were than made available to EPA to pay for machine time charges under the contract, but again none of these funds could be applied to development and data base maintenance.

And now, let me address the actions taken by the Agency which eventually led to the transfer of the sytem to the private sector. I might add here that the idea of such a transfer had been discussed as early as 1977 and that this had been a long term goal of the top program management, reflecting the concern then, as now, that Government should not compete with the private sector.

By the Fall of 1983, it had become clear to EPA that, in each of the past few years, funding of the sytem by other Agencies was

decreasing while the cost of the contract was increasing, and that this could be expected to continue and indeed intensify, thus leaving EPA in the untenable position of always having to find funds to cover costs which could not be anticipated and planned for in advance.

At the same time, pressures were being brought to bear by supporters of the system for more funding, while user complaints about the system increased and calls for improved quality, ease of use, and more frequent up-dates were on the increase. Members of Congress who had had long standing interests in the system, or who were responding to clients' letters and calls, periodically requested information from the Agency. In September 1983, EPA received a letter signed by six Congressmen, urging more support for the system. By this time, there were about 600 registered users, 60% of whom were non-government -either academic, industry or associations. These users, even with concerns for quality and up-to-dateness of the data, were none the less interested in seeing the system continue and to grow, recognizing the value of the chemical data included - some of which was not available through any other source. The Information Industry Association and others were at the same time, expressing their concerns to Mr. Ruckelshaus and members of Congress over the continued EPA operation of the system.

With a new management team in place, EPA began to address the problems associated with funding, software and hardware,

management issues, performance under the contract, billing procedures, and other Agency sponsorship. It soon became apparent that none of the other Agencies were able to increase funding, nor were they willing to take on the management of the sytem. EPA initiated an Inspector General's audit of the contract and funding arrangements. At the same time, a major information management review of all aspects of the system was undertaken to determine a future course of action and to satisfy the requirement that complex, high cost, little used, and older systems be reviewed on a periodic basis. CIS met all of these criteria. Many users complained that it was difficult to use, its structure was complex and difficult to change; it was now costing well over 2 and a half million dollars a year to operate and much more was needed to improve it; its usage was about 450 hours of connect time per month; and no major changes had taken place in the system in the last ten years. An internal management review pointed to a number of problems, including: undocumented software; a backlog of nearly 100,000 chemicals for which registry numbers had not been assigned; serious problems with agreements for use of data in some of the files; shortage of funding for even the short term; lack of a basic systems concept, stated goals and objectives, criteria for data base deletion or addition, or even an anlaysis of needs; and lack of defined responsibilities for quality control. Immediate steps were taken to reduce costs under the contract including the discontinuance of most user support and marketing activities. Two review panels were established to provide objective evaluations of the system and the framework in which

it was operating. A Blue Ribbon Panel of private sector experts in data base management, chemistry, computer services and toxicology included representatives of the American Chemical Society, the Chemical Manufacturers Association, the National Academy of Sciences, and the chemical industry, academia and citizens action groups. This panel was charged with a user survey, an analysis of the data bases, determination of what was really needed and how this need could best be met. A second panel of government representatives of Agencies interested in, or responsible for chemical information, was convened to review government's responsibilities relative to CIS and chemical data in general. At the same time, steps were taken internally to assure that all activities regarding CIS were carefully monitored and that, to the extent possible, services were not interrupted while the reviews were ongoing. Concurrently, EPA reviewed its own data bases and removed two which had been placed on CIS for lack of a better mechanism for making them available to the public. The National Institutes of Health began a similar review of its data bases, resulting in the deletion of two files as being no longer of value or duplicative of other sources. Staff worked with NTIS to refine billing and funds transfer procedures. Recognizing that the CIS capability most likely existed in the private sector, EPA issued a notice in the Commerce Business Daily requesting companies to provide a statement of such capabilities. Eight companies responded and their statements were provided to the government panel for consideration in its deliberations. At the same time, attempts were being made to up-date files, clean up others, gather

statistics on use of the system and its component data bases and in general streamline CIS operations and funding mechanisms. The reviews generated a great deal of attention, and a major concern was to maintain openness, to brief all interested parties and keep them fully informed of what the Agency was doing, and at the same time provide the panels with a full opportunity to review the system objectively and in an unbiased manner. Press accounts, often eroneous, made this difficult, and Congressional concerns were rekindled, requiring considerable time and attention.

The Blue Ribbon Panel submitted its report in August 1984. It found that existing CIS capabilities were inadequate to meet demands for chemical information; that citeria for data base selection and deletion were non-existant; that maintenance, systems standards, quality control, management resources and public awareness were inadequate; that a number of the data bases could be self-sustaining while others might continue to require government support, concurrent availability of individual data bases is desireable, though similar files should not be separated. It recommended a more appropriate management concept - a separate government management role from a private sector implementation role.

The Government Panel, jointly chaired by the Director of the Chemistry Division, National Science Foundation, and the Chairman of the Council of Environmental Quality, presented its report to the Agency in early September 1984. It found that the

CIS was not a viable or reliable chemical information system from the aspects of management, technical coverage, documentation and quality control; that no real support or resources existed within the Agencies for overcoming its deficiencies, and that the private sector had the capability to provide a more modern, responsive chemical information system. It recommended that CIS be turned over to the private sector as soon as practical; that another Government Agency be identified to effect the non-government take-over; and that an orderly and responsible transfer be effected.

Several options seemed to be open to EPA - to keep the system intact and continue to operate it; to keep it intact and have another government agency operate it; to keep the system in tact and have it operated by EPA and other agencies on an equitable cost sharing basis; to reduce the system in size to the expressed needs of EPA only and bear the total cost of operating the reduced system; to shut the sytem down and let each agency select those data bases of interest to its own operation and disseminate the information in whatever mode it felt suitable, or to turn the operation of CIS over to private industry. EPA attempted to meld the recommendations of the Panels, exploring the possibility of the National Library of Medicine (NLM) or the Council of Environmental Quality (CEQ) serving as the system manager. Neither of these were found to be practical or possible. NLM's Toxicology Advisory Board has strict criteria for the selection of data bases to be added to TOXLINE or TDB, and many of CIS's files would not meet this criteria. CEQ

required a large amount of funding to undertake the monitoring of the system and transfer to the private sector, and its role as a policy body complicates its taking on an operational role. The National Science Foundation was approached to serve as a chemical data advisory body which would facilitate government chemical data transfer to the private sector beginning with the present CIS files and expanding this to include other data bases. After review of the issue, OMB's management and budget staffs determined that they could not support a transfer to NSF and that EPA should proceed to transfer the system to the private sector.

Since EPA did not have an existing policy on making data bases available to the private sector, it obviously did not have a mechanism established for doing so. An interagency agreement was put into place whereby computer tapes of CIS files (and any other Agency data bases) would be provided to NTIS and NTIS would make them available to vendors and specific organizations or individuals at a purchase or lease fee. To encourage a firm to pick up all CIS files, a special initial fee was arrived at and announced. EPA met with each of the eight companies who had submitted capabilities statements to assure them that EPA would no longer offer the CIS service and to encourage them to make the system available commercially. Government sponsoring agencies remain responsible for file development, quality control, and up-dates as well as the transfer of tapes to NTIS. The private sector assumes the responsibility for providing on-line access, telecommunications, training, user

support and marketing. By October 1, 1984, Information Consultants Inc (ICI), jointly with Questel, began making CIS files available commercially. ICI provided the computer and telecommunications, while Questel provided training and user support. On November 1, 1984, Fein-Marquart Associates began offering the service commercially, at which time EPA's formal contract with them was closed. Both of these companies indicated their intention to add chemical data bases to their offerings and to improve the present system for ease of use. Rates to users are about 15% less than when the system was operated under EPA's contract. Government users access the system through direct contracts with ICI or FMA, or through the Federal Library Committee FLC's contract.

Other private sector firms may yet offer all, or portions of, the CIS. They would be provided whatever assistance was necessary by EPA and its staff, in an effort to assure that its chemical data is made readily available to all those who may want it, through a much improved and maintained system. As in the case of any change, some disruption has occurred with this transfer. Access code changes, telephone number changes, adjustments in procedures, paperwork involved in changing the usage contract to a new vendor, all complicate the situation. Still, in the long term, the transfer offers a stability which could not be realized under government management.

You may want to ask what lessons could be learned from this experience? In order to answer that, it is important to recap why CIS came into existance initially. At that time, no systems

for handling chemical data, or any raw data as opposed to bibliographic information, existed and no substructure search system existed. Government research institutions needed chemical data, and regulatory responsibilities placed on many agencies only intensified this need. EPA had a mandate of which no private service was, or could be, supportive in the early 1970's. The Toxics Substances Control Act is essentially an information Act. At the time it passed, no other internal systems existed which could handle all the chemical data requirements of the act, and time pressures led to the use of the CIS. Other EPA program needs (OSWER/Superfund) had neither the funding or staff to build new, better systems. Instead, data was added into CIS's special files.

Then why the development of concerns over CIS? Many changes had occurred over the years, both inside and outside of government. Issues surrounding the need for, and methods for handling of, chemical data were being addressed and steps taken to create new, efficient and cost-effective systems. Budget constraints were becoming severe in government, and were affecting the ability of any agency to assure a consistant level of funding to any information system. Within EPA, there was a lack of Program Office willingness to serve as the responsible entity for support of CIS (it had been transferred to the Office of Toxics Substances and subsequently transferred back to the Office of Administration). Systems were being built around CIS to satisfy internal needs. Inefficiencies in the system and lack of documentation were being more keenly felt as each year past, and yet funding was not available to improve the system nor to

pay for documenting it. Inter-agency management was a problem to coordinate. Management in EPA felt the need for making chemical data available to the public, but was faced with increasing costs, with no end in sight. Its concerns for costs, efficiency and effectiveness, coupled with the review requirements of the information resources management (IRM) program, led it to address concerns over the system. It recognized the support for the system within several user communities, but ultimately ruled in favor of its responsibilities to a larger community. For any information system, it is important to recognize changing conditions and to respond to these in a many which will protect the data and the citizen's right to this data, while at the same time providing a more sound operation and service.

It is the policy of this Administration, and previous ones, to encourage private sector/government cooperation and to ensure that government in no way competes with the private sector. In many instances, it is necessary for government to initially fund, and even establish within government, those data bases which permit citizens to have access to information they would not otherwise be able to get. When these data bases are fully developed, and the user community can support them, they should be transferred to the private sector, which is far better equipped to market them and to cost-effectively provide such services. Agencies' programmatic missions change with the issues of the time, and often valuable data bases may no longer serve the mainstream of concern facing their top management officials. Funding priorities change and information programs are often caught up in these. Government

agencies will always be criticized for competing with the private sector and for not providing the same quality service available through private data base suppliers. More and more Federal data bases will be made available to the public through arrangements with private sector firms. In the case of CIS, EPA is confidant that the user will have a better, more stable CIS through the steps it has taken.

Five months later ---------- The Information Consultants, Inc. - Questel relationship was terminated at the end of 1985. Today, both Information Consultants, Inc., and Fein-Marquart Associates, Inc. continue to vigorously market and provide chemical information services on-line. Since these companies began to operate CIS commercially, they have added new services, new data bases, and revamped the clearly inadequate training program EPA provided in the past.

Though it is clear that not enough time has elapsed to determine the long-range viability of operating the old EPA-NIH Chemical Information System completely in the private sector, EPA is very encouraged by the enthusiasm and determiniation to succeed of those that are providing this service and by the ready acceptance on the part of the user community to the new operational mode.